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-C Dil: (885) (205/742-761).CCLS.
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-C Dil: (5620) buoy or buoys or buoyed or buoying
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L4: Entry 1 of 1

File: DWPI

Oct 26, 2000

DERWENT-ACC-NO: 2001-015745

DERWENT-WEEK: 200241

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TITLE: Purification device for running water has floating elements arranged before and behind and left and right of anode on water surface with cathode plate on running water bed opposite to anode

INVENTOR: FUJITA, K; MAEKAWA, T

PATENT-ASSIGNEE:

ASSIGNEE CODE JAPAN SCI & TECHNOLOGY CORP NISCN KAGAKU GIJUTSU SHINKO JIGYODAN KAGAN

PRIORITY-DATA: 1999JP-0110911 (April 19, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
WO 200063123 A1	October 26, 2000	J	027	C02F001/46
JP 2001000979 A	January 9, 2001		007	C02F001/48
EP 1112966 A1	July 4, 2001	E	000	C02F001/46
CN 1302278 A	July 4, 2001		000	C02F001/46

DESIGNATED-STATES: CN US AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
WO 200063123A1	April 19, 2000	2000WO-JP02541	
JP2001000979A	April 19, 2000	2000JP-0118650	
EP 1112966A1	April 19, 2000	2000EP-0917360	
EP 1112966A1	April 19, 2000	2000WO-JP02541	
EP 1112966A1		WO 200063123	Based on
CN 1302278A	April 19, 2000	2000CN-0800619	

INT-CL (IPC):  $\underline{\text{B01}}$   $\underline{\text{D}}$   $\underline{\text{53}}/\underline{\text{86}}$ ;  $\underline{\text{B01}}$   $\underline{\text{D}}$   $\underline{\text{53}}/\underline{\text{94}}$ ;  $\underline{\text{C02}}$   $\underline{\text{F}}$   $\underline{\text{1}}/\underline{\text{46}}$ ;  $\underline{\text{C02}}$   $\underline{\text{F}}$   $\underline{\text{1}}/\underline{\text{48}}$ 

ABSTRACTED-PUB-NO: WO 200063123A BASIC-ABSTRACT:

NOVELTY - Purification device for running water has a cathode plate arranged on the running water bed and a anode plate arranged on the top surface opposite to the cathode. Floating elements are arranged before and after and left and right of the running water flow direction of the anode plate so the anode plate sinks under the running water surface.

DETAILED DESCRIPTION - A positioning means is arranged on the anode means to maintain the upper surface position opposite to the cathode. An electric field generating mechanism is positioned on the anode and the cathode plates and water polluting substances contained in the running water are oxidatively decomposed by a high electric field pulse.

An INDEPENDENT CLAIM is also included for the running water purification treatment using this device.

 ${\tt USE}$  -  ${\tt Used}$  to remove water polluting substances such as nitrogen and phosphorus from running water.

ADVANTAGE - The purification of a flow of running water is possible at high efficiency and workably.

DESCRIPTION OF DRAWING(S) - The figure shows a section drawing of purification device.

Conductive Porous Metal A

Oxide Electrode, Platinum Electrode B

Gas Collector C

Seal Plate D

Cathode Plate E

Floating Element F

Turbulent Flow Generating Plate G

Movable Sides h

Differential Transformer I

Gas Collection Pump P

Flow Meter V

Turbidity Meter Tu

Control Device CPU

Electric Field Generator PA

CHOSEN-DRAWING: Dwg.1/5

TITLE-TERMS: PURIFICATION DEVICE RUN WATER FLOAT ELEMENT ARRANGE LEFT RIGHT ANODE WATER SURFACE CATHODE PLATE RUN WATER BED OPPOSED ANODE

DERWENT-CLASS: D15 J03 X25

CPI-CODES: D04-A01M; D04-B07B; D04-B07C; J03-B;

EPI-CODES: X25-H03;

UNLINKED-DERWENT-REGISTRY-NUMBERS: 1531U; 1925U ; 1927U ; 1966U

SECONDARY-ACC-NO:

CPI Secondary Accession Numbers: C2001-004188 Non-CPI Secondary Accession Numbers: N2001-011959

	27 C O O O 21 EAST Browser - 1.9: [12] 1 and 8   US 4915046 A 1 Tag; S   Doc: 4712 [SURTED]   Format : KWIC Ebs Ect. Vew Took: Window Heb		
	ages 18 0 S C P Kind Codes	Onited States Patent [19]	[11] Patent Numbers 4,913,84
	6208929	Thomas, Jr. et al.	[45] Date of Patent: Apr. 10, 199
	US 5935412 A 6 「「「「「「「「「「「「「「「	[54] WATER CLARIFICATION	789-26 12/1980 U.S.S.R.
	2 US 4755305 A 17 [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [		916418 4/1982 U.S.R.
0 5	4623436 A 13		IGITAM 4/1943 U.S.E.R., OTHER PUBLICATIONS
<b>3</b>	7 US 4439290 A 7 C C C C C C C C C C C C C C C C C C	Allignee	"Dewitcring and Densification of Coal Watte by Di
*	I - PAG-NO.	[31] Appl. No.: 328,057 [22] Filed: Mer. 33, 1989	reen of Mines, 1976.
¥ 1	DENTIFIER:	Refat	Attorney, Agent, or Firm-Pitts and British
<b>†</b>	Water clari	[63] Continuation-in-part of Ser. No. 197,230, May 23, 1988, absordanced.	[57] ABSTRACT
<u></u>		[51] List, CL	A water clarification apparatus (10) and method for removing dye and other organic matter from wast
₹ 0	. KWIC	210/917; 204/134; 204/149 [58] Field of Search 210/243, 247, 748, 917,	water clarification apparatus (10) comprises at least on first electrode (12) for being immerced in the west
49	Detailed Description Text - DETX (6): As indicated above, the apparatus and mathod of the present immediate :	[56] References Cited	water (32) within the reservoir (11), and at least one second electrode (14) for being immersed in the waste
;	primarily designed for removing dye from waste water, and Fig. 1	S. PATENT DOCUMENTS	water (33) at a presciented distance from the first elec- trode (12). The apparates further comprises a DC
<b>ø</b>	Generally waste water 32 from the dying operation is directed into a dye legoon 11, the direction of flow in the leaner is directed into a dye legoon	3,03,592 V.1962 Rouges 204/149 3,44,497 12/348 Resid 204/149 3,600,246 8/1971 Sables	power supply means (20) to which the first and second electrodes are connected such that the first electrode
Ø 1	ragoon being indicate of suspend particles,	\$/1972 Armstrong	defines an anode (14) and the second electrode defines cathode (14). In accordance with the method of the
0 4	Accordingly, the anode 12 is immediate in the dys waste water 32, and, at a preselected distance downstream, the cathode 14 is immersed in the waste water.	Tumball 210/917 Gerbardt et al. 204/149	process mychaota, and power appays means (20) is not lized to energize the smode (12) such that electrical current passes through the waste water (42) from the
4	embodiment, the anode 12 is	EGN PATENT DOCUMENTS	first electrode, or anode (12) to the second electrode, o cathode (14), causing the dye in the wasta water (32) to
đ	ion, suspended in the water. circuitry means 22 thereby	8/1972 Fed. Rep. of Germany .	coagulate into a precipitatable solid which can be readily removed from the waste water by conventions
<b>Ø</b>	2. Of course, given the conductive properties through the waste waste 12 from the enode is been found that	35-28929 3/1978 Impan 8701007 4/1986 PCT Incl Appl. 566776 8/1977 U.S.S.W.	sewage treatment means.
8.1	through the dys water 32, the dissolved tatable solid, illustrated in the figure	•	1350 Silvano 4 (miles)
1 4	able form, can be all site and the clarified		
( <b>42</b> (	the waste water, with tl	26 27 44 30, 20	01 / 10
<b>5 4</b>	tent plant, t		الم الم
<u> </u>			3 E NOWER SOURCE
9 <b>4</b>	Current U9 Cross Reference Classification - CCXR (1): 205/758	112/31	
<b>8 8</b>	Current US Cross Reference Classification - CCXR (2):	91	
<b>49</b> 6	205/761	\$ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	21 120
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<b>55</b> 4			12
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2 L	Periodocina de Maria (Maria Anti-Artica)		
	U8 6558527 B2 8 0 0 0 0 0 0 0	Control States Fatent [19] Fremont et al.	Patent Number:
	US 5935412 A 6	1	esi Date of Patent: Jul. 5, 198
		[74] CONTINUOUS DEWATERING METHOD [75] Inventors: Heary A. Fremont, Wyoming:	·
0	U8 4623436 A 115 C C C C R	William C. Dorman, Hamilton, both of Ohio	
<b>E</b> 2	7 US 4439290 A 7 C C C C F F C C C C C C C C C C C C C	Assignee	1/1978 Ramines
<del>х</del> Ŧ	US-PAT-NO: 4755305	[21] Appl. No.: 881,900 [22] Filed: Apr. 11, 1986	VISES OTHER
î	DOCUMENT-IDENTIFIER: US 4755305 A		Excerpts from McGraw Hill Enolclopedia of Science &
<b>↑</b> <del>↑</del>	TITLE: Continuous dewatering method	[63] Continuadon of Ser. No. 416,901, Sep. 13, 1982, abas- doned, which is a continuadon-de-part of Ser. No. 251,219, Apr. 6, 1981, Par. No. 4671, 374, and acre-	10cmatory, pp. 136-174, 559-601, 314, 207, 23, 182, 583, 37, 104, 169, 534, 599, 505, 166, 194-195 and \$42-544.
₹	KWIC		(Lts) continued on next page.)  Prinary ExaminerTom Wyse
06	Detailed Description Text - DEIX (5):	[53] Let. CL <sup>4</sup> Co2F 1/46 [53] U.B. CL 2007(49, 204/149,	Attorney, Agent, or Firm—Evelyn M. Sommer [57] ABSTRACT
9 [	module M is shown in FIG. 2 100, 102, 104, 106, and 108	[58] Field of Search	An apparatus and method for dewatering shudges and
ଚ ବ	tes 110 and 112	[56] References Cited	tochniques including placing anode and cathode elec-
ø 0	110 and 112 are fabricated from construction-grade wood members with the	S. PATE	electrical energy to the electrodes to establish an elec-
	1. Lines.8" times.16 board ald secured together about a styrefoam floation.  1. Lines.8" times.16 board 118 secured together about a styrefoam floation.  1. A secured together about a styrefoam floation.		use near in the studge. Charged particles within the sludge, including macro-molecules, colloids, and cus-
<b>a</b>	Support floats . The end plates 110 and 112 that secure the electrode support floats 100-108 together to complete sets.	1,198,867 971916 Nodom . 1,498,822 L/1921 Van Der Notto . 1,550,808 3/1932 Brits .	product permises, electrophoretically migrate to the oppositely charged counter electrode and consolidate.  A filtrative madia located as an electrode and consolidate.
40	ss.8", times.16' boards. Accordingly, or ss.16' overall dimensions.	9/1932	sillus the electro-ofmotic removal of water from the sludge to encourage solids densification. The electro-
10		6/1953 Hartman . 6/1963 Rusell . 8/1967 Nebtl	energy applied to the electrodes is a chapped, time varying, intermittent unidirectional current having a
<b>Ø</b>	ports for the	12/1967	rapid rise edge which provides dewatering results com- perable to prior methods that used direct current or full
ğ. <b>#</b>	the intermediate electrode support or the cathode assemblies 122 as shown		AC current but at substantially reduced energy con- sumption to provide more economical dewatering.
4		4/1973 Schillegs .	Presently preferred optimum conditions for practicing the invention are also disclosed, including means for
( <b>d</b>	cion Text - DETX (7):	7/1974 8/1975	applying the rechiliques of the disclosure to a continuous dewatering method and an apparatus for practicing
96	LU4, and 108 each include four equi-spaced she anode 120 is a schedule 40 carbon	353,542 10/1975 Vertman . 3,223,135 12/1978 Woodhouse et al 3,839,028 5,1976 Sullivan	tast method. The application of the electrokinetic tech- niques to other processes such as electrodislysis, includ-
18	and secured at its upper the side of its	1/1978 Pepping	ug excurtiyas (using a membrane or bipolar mem- brane), desalinization or metathesis and electrowin.
æ	live ilout. An end cap 126 is located at the lower end of each anode 120 the interior of the <u>enode</u> . As shown in PIG. 8, a threaded stud 128 is	4.134.66 1/1978 Kunkle 204/782.2 4.134.66 1/1979 Kunkle 204/701	ning, including electroplating, and other electrophoretic processes is suggested.
යු ය	d as by welding to the upper end of each anode 120 and serves as a life connection to a power carrying wire 130. In FIG. 2, only the	ust continued on next page.	11 Claims, 7 Drawing Sheats
2	shown connected by the		
49	trode supports floats 104 and 108 are likews 130 from the three anodes electrode support	•	
<b>A</b>	wn) that passes through the power		0,7
● 5			
4	red Description s shown in FIG. ort floats 102		
23	s assembly 122 is designed to both function as an electrode removal device. Each cathode assembly 122 includes an outer		
	g or sock 132 cube closed at		
	such as D		

)i [] Bluels 10, Highlight all hit terms initially Current OR | Current XRef | Retrieval C A BRS farm A Bektom | Edinage | W Tool | Walthal Search | Let | Browse | Queue | Gear Default operator: OR 11 and 110 -E Drafts
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-E Li: (885) (205/742-761).CCLS.
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-E Li: (36349) carbode or cathodes
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	V Pages 1 S C P Kind Codes	United States Patent 1191	[11] Patent Number: 4 034 413
	US 6287450 B1 14		Date of Patent: Au
	US 6007693 A 36 T T T T T T T T T		
	US 5958213 A 12 [ [ [ [ [ [ [ [ [ [ [ [ [ [ [ [ [ [	[54] METHOD AND APPARATUS FOR	\$,122,274 6/1992 Heaken
E		ELIMINATING ODORS IN SEWAGE SYSTEMS	
<b>24</b>	US 5935412 A	[75] Inventor: Edward C. Brainard, II, Marlon,	By Nigel Calder, Boatowner's Mechanical and Electrical
3 %		[73] Assignee: Atlantis Limited Partnership, Marion,	Manual, Second Edition, p. 133, no date available.  "Wastewater Treament Plant Odors and Control", The
<u></u>	U3-PAT-NO: 5935412	Mass.	Neuronal Environmental Journal, Jan./Feb. 1995, pp. 28–51.
ţ	DOCUMENT-IDENTIFIER: US 5935412 A	Appl. No.:	Francy Examiner—Aria S. Phisge Attorney, Agent, or Firm—Young & Thompson
Î	TITLE: Method and apparatus for eliminating odors in second	Filed: Jun. 17, 1997	[57] ABSTRACT
주	systems	[52] U.S. Cl. 200, 682, 205, 683, 205, 745, 205, 683, 205, 745, 205, 683, 205, 745, 205, 683, 205, 745, 205, 683, 205, 745, 205, 683, 205, 745, 205, 745, 205, 745, 205, 745, 205, 745, 205, 745, 205, 745, 205, 745, 205, 745, 205, 745, 205, 745, 205, 745, 745, 745, 745, 745, 745, 745, 74	A scrubber and method for precipitating a sulfide in water which contains hydrogen sulfide or a mercaptan. The scrub-
<b>4</b> 0	KWIC	[58] Field of Search 205/745, 494; 204/242, 271, 275	ber includes a sacrificial first metal anode and a second metal cathode which are in physical and electrical contact and suspended into the water to form an electrolysis cell of the
Ø	Abstract Text - ABTX (1):	[56] References Cited	anode, cathode and the water. The second metal is more noble than the first metal. Preferably the anode is iron and
•	A scrubber and method for precipitating a sulfide in water which contains	U.S. PATENT DOCUMENTS	the cathode is stainless steel. When so constituted, the anode forms from oxide which reserve sich suffic from the bulleting
) <b>ø</b>	metal anode and a second metal cathode which are in physical and electrical contact and suspended into the water to form an algorithmy and contact and suspended into the water to form an algorithmy and contact and suspended into the water to form an algorithmy and call of the	2/1974	suitable of the mercaptan to form an iron sulfide precipitate. The snode and eathode may be coplanar and suscended in
ø c	the first	6/1988	the water with a free-moving float which facilitates contact of the water with the anode, or may be reds which are rethered and invested to form.
a	hydrogen sulfide or the marcaptan to form an iron sulfide precipitate. The	4,950,310 11/1999 Umini . 4,956,100 9/1990 Reicher . 5,085,733 2/1997 Sherman 2005/771	the Carlos of th
4 6	float which facilitates contact of the water with the anode, or may be rods which are tethered and thisted to form a triath the notes.		to Channes, 2 Drawing Sports
10			1710
<b>1</b>		(	
. #			
4	steel dethode which are suspended into the water to form an sis cell, and in which the anode and cethode are coplement and in the water with a float which facilitates contact of the water with		
<b>4</b> 65	the anode .		-
<b>e</b>			
9 40			2
<u>a</u>			-
æ]e	anode and cathode suspended with the float beneath the surface of the water.		
3 6			
	:	-	
•	shown in side shode 14 in the	14 19	
<b>e</b> 4	txed location) to promote the	- 21	4 <i>*</i> 4
i e	to provide a physical and an electrical connection between anode 12		
	ine anode and cathode are spaced apart a distance selected to ; of electrolysis.		
	Detailed Description Text - DETX (5):		

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United States Patent [19] [11] Patent Number: 5,630,934	INGITU TREATMENT SYSTEM FOR   FOREIGN PATENT DOCUMENTS     INGINITING THE FORMATION OF AND   53-22187 91948 Japan   204150	• • –		204/150; 205/724, 730, 731, 731, 731, 731, 731, 731, 731, 731	4,561,948 12/1948 Salire 204/130 a tallings pond are provided with grid of meal meth or 4,565,134 61947 Orac 204/120 Sarphite in place of the inserted rode. The grids provide a 4,575,347 7/1951 Nighton 204/135 5/108,565 4/1992 Cook 204/149 15 Chains, 2 Derawing Sheets	-1-34 -30	40 23 47 Z7 - Z - Z - Z - Z - Z - Z - Z - Z - Z	25 18 18 20 20 20 20 20 20 20 20 20 20 20 20 20	
S	9 us 5935412 A 10 us 5759384 A 11 us 5746904 A 12 us 5630934 A	US-PAT-NO: 5630934	TITLE:	Detailed Description Text - DETX (34):  It sometimes happens that the pH of the water in the pond can vary with the depth of the water. often in that the surface water is more acidic than the depth water. A float 47 is provided to ensure that the anode remains upright, and accessible to all depths. An anchor 49 holds the anode in position relative to the floor of the pond.	Current US Original Classification - CCOR (1 205/742	A 205/745 Close Asserting Classification - CONR (4):			

which is not a few with a second USPAT USPAT Clays in phosphate alimes, the party are processes for executive separation.

Clays in phosphate alimes, the cathode has been designed to float on the surface of the water but above the surface of the silme material. See, for cathode is located at the surface of the supernatant liquid, lower dewatering rates occur as well as higher energy consumption. This is principally because the conductivity of the slime is higher than that of the supernatent water itself. Further, lower alime is higher than that of the supernatent water when the process is used. Thus, it is critical to the process that the cathode to water and the phosphate slime with the cathode actually touching the the water and the phosphate slime with the cathode actually touching the material with openings of at least several millimeters guarge. Preferably the covers the entire settling pond for the most efficient dewatering of the phosphate alime. The metal used for the most efficient dewatering of the cathode material such as copper or stackhode can be of any convertional cathode material such as copper or stackhod can be of any convertional cathode is placed at the spread with zinc costing. Preferably the screen is roll spread onto the surface of the slime material. To assure that the cathode is placed at the appropriate demarkation line between the USPAT USPAT USPAT USPAT USPAT Detailed Description Text - DETX (7):
Once the phosphate slime has been placed within the holding facility, the cathode is placed at the surface of the phosphate slime but below the surface of any supernatant water. In prior art processes for the electro-separation of the phosphate slime material so that the cathode can sink through the supernatant liquid but not significantly sink into the slime material, cappedially at the beginning of the electro-readinentation process. The specific construction of the ppecific gravity adjuster is not particularly critical as long as it results in the combination hollow plastic and cathode having a supernatent liquid and the phosphate aline, a specific gravity adjuster is secured to the surface of the cathode to hold it in place. Any conventional machanism can be utilized for this adjuster. In one embodiment, the specific gravity adjuster is made of a hollow plastic or foam material which will adjust the specific gravity of the cathode to between one and the specific gravity of the the cathode to between one and the specific gravity of the phosphate sline material so that the cathode. When the solid content of the phosphate slime rises to a level specific gravity slightly greater than 1.0. As the cathode metal screen has a specific gravity of about 7 to 8 and the floating material made of foam or hollow plastic has specific gravity significantly lass than 1, the combination of these two can be readily adjusted to create a combination having a specific gravity slightly greater than 1. The particular choice as to construction is not critical. However, what is critical is that the cathodes sink through the supernatant liquid to rest on or slightly below the surface of the phosphate Kind Codes about 20% solid, the cathode will be supported by the phosphate slime self. The weight of the cathode is generally sufficient itself to for Process for the dewatering of phosphate slimes An exemple of L ם ב Σ ĺΣ ľΣ Σ surface of the phosphate slime. structure of the cathode is shown in PIGS. 2 and 2A. р Ľ Ц U ં ㅁ ㅁ ㅁ L Ľ С ם ם US 5435893 A ш ш L ט 5435893 38 17 10 37 14 Document ID v DOCUMENT-IDENTIFIER: US 5759384 A US 5746904 A US 5545310 A US 5935412 A US 5630934 A US 5543034 A US 5435893 A US-PAT-NO: 17 27 O 🗷 💆

clay: Florida Noralyn primary washer clays, solid content 9%

**EXAMPLE 4** 

test unit: 200 ml glass beaker power: D.C. 2.4 V., half wave, 7.8 ms test time: 98 hours

energy consumption: 25.8 KWH/ton dry basis clay weight: wet: 68.2 gram; dry: 18.9 gram final solid content: 28% current density: 0.25 ms/cm<sup>2</sup>

## EXAMPLE 2

Example 1. The method and test material were also the same as those in Example 1. The differences between Example 2 were the current dentity and processing time. In test 2, D.C. power of 2.3 Y and 12.0 ma current with a half wave were used for 40 hours. The average current density was 0.26 ma/cm<sup>2</sup>. After 40 hour treatment, the weight of clays before and after drying was 44.1 gram and 12.6 gram, respectively. The final solid contant of clays was 29% and usul emergy consumption was 48.8 KWH/kon dry basis, clay. Florida Noralyn primary weaker clays, solid the same material was used as that in In this test,

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**49 49** ●

**a** 

\* Ŧ Î Ŷ content 9%

test und: 200 ml beaker power: D.C. 2.3 V., half wave, 12.0 ma test time: 40 hours

current density: 0.26 ms/cm<sup>2</sup>

energy consumption: 48.8 KWH/ton dry basis clay weight: wet: 44.1 gram; dry: 12.6 gram final solid content: 29%

유

## EXAMPLE 3

mig in the bottle was 17.0 cm. An iron screen with 6 mm opening was placed on the top of the clay to act as a cathodic. The electrodes were connected to a 8.0R phase-controlled half-wave device which was hooked to m adjustable transformer. This transformer was dis ä ä treatment, the clays were taken our and weighed. The weight of wet clays was 520 grann. After drying in an oven the dried clays weighed 150 grann. Thus, the final solid content of clays was calculated as in Example 1, at 2595. Total cacregy consumption was 52.6 KWH-from dry basis. Florida IMC phosphate clays with an initial solid content of 95% was used in this example. The clays were put in a 2000 ml normal plastic bottle with diameter 10.5 cm and height 18.0 cm. The height of clays at the begin rectly plugged into a 120 V AC socket. The D.C. volleage and D.C. ourrent applied to the electrodes were measured by a multitester. In this experiment, D.C. 7.2 applied to the clays for 44 hours. The average current density as 0.25 navers. During the testing the eath orde was kept in touch with the surface of clays and decented water was drained manually. After 44 hour V, half wave SCR phase-controlled, and 20.0 ms were

clay: Florida IMC phosphatic clays, solid content 9% test unit: plastic bottle, Diameter = 10.5 cm, unit: plastic Height

power D.C. 7.2 V., half wave, SCR phase-controlled, 20.0 ma alay weight: wen 520 gram; dryr, 150 gram Inal solid content: 29% ourrent density: 0.22 ms/cm²

V and 79 an current with full-wave amoothed intead of half-wave SCR phase-controlled was applied to the clays. The average current denity was 0.235 ma/cm². During the first 24 hour testing the eathods was leept in touch with the surface of clays and decent water was 10 drained manually. After 24 hour treatment a few gram clays were taken out to determine solid content at this time. The solid content after 34 hour treatment was 57.0 KWH/no dry bash. When the solid content reached the 139% at a mm in diameter hole was defliced on the side wall of the bottle above the smode. This bole made drainage automatic. After 24 more bour treatment, the clays were taken out. The clays were divided into two parts one was a core part and another was an amulia. The soild content of core part, which was 46% of total wet clays weight, was 39%. The average soild content of clays including core and annulus was 34%. the same as those in Example 3. In this test D.C. 10 In this example the method and the

clay: Florida IMC phosphatic clays, solid content 9% test unit: plastic bottle, Diameter = 10.3 cm. at unit: plastic bottle, Diameter=10.3 cm, Height=18.0 cm

power: D.C. 10.0 V., full wave smoothed, 29 ms current density: 0.35 ms/cm<sup>2</sup>

24 hours sould content 29%
48 hours average solid content 33.8% solid content
in the core of clays (46% trail weight) 39%
energy consumption: 57.0 KWH/ton dry basis (up to

We claim:

1. A process for the in stin dewatering of phosphaen sime containing electrosensitive clays contained in a settling pond comprising the process of:

(a) placing an anode at the bottom of the settling pond for the storage of the phosphaen alime.

(b) filling the settling pond with phosphare alime containing a soill portion of electrocensitive clays, (c) placing a scaling fortion of electrocensitive clays, (c) placing a scalinder of the soil door-tion of photophare alime bull below the surface of any supernature liquid contained in said phosphate

slime;
(d) applying an electrical current to the cathode to produce a separation of the solid portion of the electrosensitive clays contained within the phosphate slime from any liquid contained in the phospaire slime while maintening contact between and cathode and the surface of the solid portion of the

phosphate sline; and
(e) draining off any decented water to produce dewatered phosphate slimes with a solid content of at least about 15 percent.

2. The process of claim 1 wherein the current applied to produce the phosphate slime is a direct current.

3. The process of claim 2 wherein the current density 60 of the current applied is from about 0.1 ma/cm² to about

 The process of claim 3 wherein different current 3

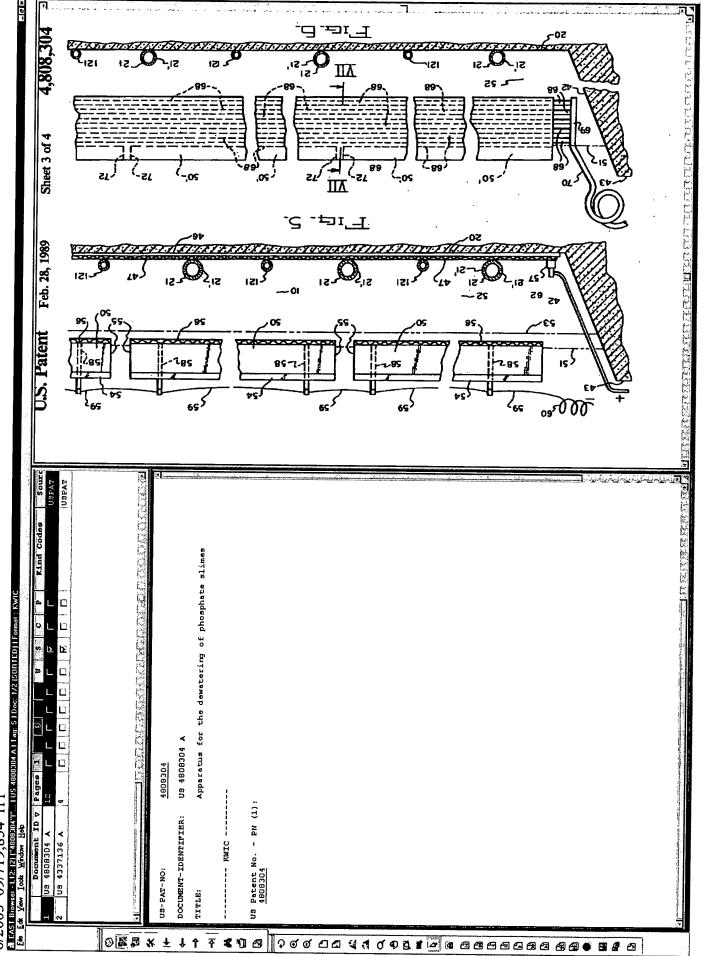
densities are used depending upon the type of clay contained within the phosphate slime.

5. The process of claim 4 wherein the wave form for the current applied is adjusted, depending upon the nature of the clays contained within the phosphate

energy consumption: 52.6 KWH/ton dry bash

Current US Original Classification - CCOR (1):

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[11] 3,816,073 [43] June 11, 1974	3,568,215 3/1971 Riedel	An odor ellinitation system for a portable builet. The older comprises a bowl member charged initially with water to a predetermined level and having liquid and solid waters deposited therein. A pair of electrodate is immersed in the water between the top and bottom of the bowl. The lower electrode can be formed by coating a conductive layer on the bottom of the bowl. Switching means connecte the positive terminal of a D.C. voltage, sources to the lower electrode and the negative terminal on the upper electrode whereby oxygen forms at the bottom electrode and rises to the top of the water, oxidizing odors, bacteria and algoe of the water.	
United States Patent (19)	(54) ODOR ELIMINATION SYSTEM   (76) Inventor: Charles H. Miller, \$4065 Avenide   Carranza, Le Quinta, Calif. 92253   (22) Filed: Dec. 1, 1972   (21) Appl. No.: 311,194	[52] U.S. Ct. 21/103 R, 4/10, 4/100, 5/100, 4/131, 21/54, R, 21/55, 204/149, 204/280 [51] Int. Ct. 21/54 R, 102 R, 5/13/10, 13/04 [58] Field of Search. 21/54 R, 102 R, 5/13/11, 4/10, 100; 99/220; 210/430; 204/149, 280 [56] References Cited UNITED STATES PATENTS 981, 222 1/19/11 Fration PATENTS 981, 222 1/19/11 Fration PATENTS 204/130 2/14/04 [56] Mehastr 204/13 2/14/04 [56] Mehastr 204/13 2/04/14 [56] Mehastr 204/13 2/04/14 [56] Mehastr 204/13 2/04/14 [56] Mehastr 204/13 2/04/14 [56] Mehastr 204/14 [56] 2/04/14 [56] Mehastr 204/14 [56] 2/04/14 [56] [56] Mehastr 204/14 [56] 2/04/14 [56] [56] [56] [56] [56] [56] [56] [56]	The state of the s
Document ID v Pages   1		Declaration and a parameters of the content of the conducting naterial and a parameters. TITLE:  Detailed Description Text - DETA (8):  The alectrodes 36 and 38 can be formed of any current conducting naterial with will not scode in the express containing water. In the ambidiant distribution which will not scode in the express containing water. The ambidiant distribution which is content of a parameter on the surface thereof in Figs. 2 and 3, the electrodes 36 and 38 are formed of sealed thereof with a flaxible chart is content on the surface thereof with a flaxible peary. The upper electrodes 36 is hollow so as to find on the top surface 34 of the reservoir water 32. The lower electrode 36 can be finited or otherwise weighted so that it is desired to install the system during the nanutecture of the toilet. If it is desired to install the system during the nanutecture of the toilet. If it is desired to install the system during the nanutecture of the toilet. If it is desired to install the system during the nanutecture of the toilet. If it is desired to install the system during the nanutecture of the toilet. If it is desired to install the system during the nanutecture of the toilet. If it is desired to install the system during the nanutecture of the toilet. If it is desired to install the system of the boal in the boal in the tops of the initial water level, but it is preferred to float the upper electrode alloating adjacent the top level of said water;  Claims Taxt - CLTX (3):  CLIAINS Taxt - CLTX (4):  CLIAINS Taxt - CLTX (4):  CLIAINS Taxt - CLTX (5):  CLIAINS Taxt - CLTX (6):  CLIAINS Taxt - CLTX (7):	1

4,565,617 EMITTING A CODED SIGNAL CONTINUOUSLY UPON THE MODULE REACHING 2m M. O TRANSMITTER | ANODE + OUTSIDE ELECTRODE INSIDE ELECTRODE (H2 COLLECTOR) ≈ ځ س Sheet 2 of 2 - 9-CATHODE 의 ᅃ 0 입 Jan. 21, 1986 **4-7**::: ۵ij 4 의 의 롈 U.S. Patent 40,29 **모** 8 ğ ႙ F16.6 F16. USPAT USBAM S USPAT USPAT USPAT USPAT USPAT shows in vertical cross section an alternative construction of the IIGS. 1, 2 and 3 wherein a skirt is provided around the entire float, ples collection of the anode gases, such as oxygen or chlorine. Photovoltaic energy gas generating apparatus 6/2003 09/719,854 116 8 9 CCXR (4): (3) CCXR (7): 9 Current US Cross Reference Classification - CCXR 204/229.2 CCXR Current US Cross Reference Classification - 204/278 Current US Cross Reference Classification - 204/292 Classification -CCOB Classification Classi fication נו נו Current US Original Classification - 204/228.2 Drawing Description Text - DRIX (8): US 4565617 A Current US Cross Reference Current US Cross Reference 204/290.01 Current US Cross Reference 204/290.11 23 23 æ œ DOCUMENT-IDENTIFIER: US 4584082 A US 4601794 A US 4596637 A US 4595475 A US 4622111 A US 4582582 A float of FIGS. 1, which enables col KWIC US-PAT-NO: TITLE: \* B B O Ŧ Î Ŷ 吞 **₹**10 Ø ೧ ೮ ೮ **₫₽₺₫₫@₫₫₫₫**₽ 00 4 4 **∄ ∄ ♠** 3 *a* 

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United States Patent [19] [11] Patent Number: 5,569,809  Gui [45] Date of Patent: Oct. 29, 1996  [54] METHOD FOR DESTRUCTION OF S.391,770 2/1995 Gui et al	223 Filed: Jul. 3, 1995   Primary Examines — Anun S. Phasge Attorney, Agent, or Firm—Norean C. Johnson; William H. Primary (1512) Lul. C. 1. 10. C. 205742; 205779.5; 205779.5; 205779   153.1 U.S. C. 204731; 588204; 212; 205779.5; 205779   173.1 C. 204731; 588204; 212; 205779.5; 205779   173.1 C. 204731; 588204; 212; 205768; 174.2 C. 204731; 205768; 174.2 C. 204731; 205768; 174.2 C. 204731; 205779   174.2 C. 204731; 205768; 174.2 C. 204731; 20	A DCE-031GC
March   Marc	US-PAT-NO: 5569809  DOCUMENT-IDENTIFIER: US 5569809  TITLE: Method for KWIC  Detailed Description Text - DETX  Electrode surface descrivation polymerization is a common problem be overcome through either mechaniel ectrochemical cleaning. Mechaniel ectrochemical cleaning. Mechaniel ectrochemical cleaning between the polishing davice. Blectrochemical compare a polishing davice. Blectrochemical combination of both Ultrasonification have also been felectrochemical cleaning. Compare descrivated (solid curve). and the curve) in DWE containing Arcoller alectrochemical and containing Arcoller alectrocaduction at -3.0 V. The alectrocaduction at chime are active electrodes. Periodical por active electrodes.	ing sagasasasasasasasasasas

5,772,859 which may be separate from the water pur. Alternatively both the water pan and the ink bearing portion of the priming press may be electrically conductive, and connected to a DC power supply, so that both the wathings and the electrolysis Jun. 30, 1998 with ink bearing portions of printing presses, particularly officer printing presses. The weiting liquid is based on water and has press it evels of scribity in electrical conductivity. The wetting liquid is subjected to electrolysis in a tank can be curied out in the electrically conductive water pur.
The method increases the speed at which the ink dries in the primiting phase and thereby enhances the efficiency of the primiting press. A method and device for treating the wetting liquid used FOREIGN PATENT DOCUMENTS Primary Examiner—Arus S. Phasgo Attorney, Agent, or Firm—Young & Thompson 12 Claims, 2 Drawing Sheets 0 112 745 7/1984 Burspens Pat. Off. 3,681,213 8/1972 Helt et al. .... 4,601,974 7/1986 Kila et al. .... 5,055,170 10/1991 Saito ......... 5,578,193 11/1996 Aoki et al. ... ABSTRACT Patent Number: Date of Patent: [45] \$ DEVICE FOR TREATING WEITING LIQUID IN PRINTING PRESSES, PARTICULARLY FOR OFFSET PRINTING PRESSES ... MIGTA01622 Arturo Guertni, Via A. De Gasperi 20, Castrezzato 25030, Italy 205/761; 204/228, 242 <u>19</u> 29 Foreign Application Priority Data **United States Patent** U.S. PATENT DOCUMENTS PCT/EP94/00783 Mar. 14, 1994 References Cited Oct. 31, 1995 Oct. 31, 1995 PCT Pub. No.: WO95/03177 PCT Pub. Date: Feb. 2, 1995 1/1933 Durham. \$45,656 į U.S. Cl. Field of Search Jul. 21, 1993 [TT] \$ 102(c) Date: \$ 371 Date: Appl. No.: PCT Filed: Inventor: PCT No.: E.C. 1,895,125 Guerini 5. [92] E 22 E [51] [8] 8 [52] [58] [36] USPAT USPAT USPAT USPAT USPAT The wetting liquid with this level of acidity and electrical conductivity value can then be subjected to electrolysis using a graphite anode, or a carbon anode, or a platinum plated titanium mesh anode, and at least one steel Device for treating wetting liquid in printing presses, particularly for offset printing presses anode (2a) comprises ㅁ ш ĺΣ 2 wherein said 6 DE DE Current US Cross Reference Classification - CCXR 205/742 Ц anode, or a platinum pracue cathode, preferably a stainless-steel one Claims Text - CLTX (6):
4. The device according to claim 1, platinum-plated titanium mesh. Description Text - DETX (4): Ш us 5772859 Document ID V Pages 1 ם ם ш 5772859 1.5 = 7 0 0 0 DOCUMENT-IDENTIFIER: US 5911868 A US 5952542 A UB 5919350 A US 5904832 A US 5725751 A US 5702587 A US 5772859 A KWIC US-PAT-NO: Detailed TITLE: ٥. ا 18 **8 13 3** 予 7 | ? වර ටඩ ද් 1 ර 9 8 € 2 6 2 8 8 8 8 8 8 8 8 Į ↑ **₹**¶ Ø **∄ ∄** ● <u>a</u>

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37	US 5795459 A	United States Patent 1191	[11] Patent Namber: 5,730,856	P
38	US 5772859 A	Omasa	[45] Date of Patent: Mar. 24, 1998	•
41 41 69	US 5759384 A	(54) METHOD FOR TERATING WASTE LIQUID WITH ELECTROLYTIC OXIDATION AND PARAATUS FOR CARRYING OUT THE SAME	06287799 A 10/1994 Japan. 06304461 A 11/1994 Japan.	 
£ 43		[75] Inventor: Ryuddin Omese, Pulitewe, Jepen	Primary Examiner—Aran S. Pitatgo Attorney Agent or Firm—	عاضد وم
411		[73] Asiigne: Nibon Techno Kabushid Katsha, Tokyo, Japan	c,Daleimer,Sullivan,Kuncz,Levy,Eliele and I	
<b>4</b>	DOCIMENUT TREMTETED. 110 C2200C .	[21] Appl. No.: 569,321	[57] ABSTRACT	•
	os orsuesos A Method for treating meste limita site of	File	An electroless mortal parting waste liquid (4) accommodated in an electrolytic oxidation tank (2) is treated by electrolytic	
<b>주</b>		[30] Foreign Application Priority Deta. No. 25, 1995 UPI Jupes	oxidation with vibrating and fluidizing the waste liquid by means of an oxillating editor (10) to recover aideal by the	
₹ <b>0</b>	KMIC	[51] Tet Ct. Copy 1461	which as active component for fertilizer including phosphorus remains as a fertilizer solution. When the weste liquid is	
ž		[58] Field of Search 205771; 204722, 248, 273	neutralized by a neutralizer including an active component for fertilizer and a potassium, altrogen, etc., the fertilizer electric bester that	وكيا أندا
구 @	liable to be electrodeposited, and from which the electrodeposited metal is easily exfoliated. An example of the preferable material for the cathode is	[56] References Cited	obtained. The cacillating either comprises an oscillation generator including a 25 to 500 Hz oscillating motors (15), an	
	<u>extracts</u> area. The anode 6 is preferably formed of a material through which current is liable to flow and which is substantially insoluble and inconsumable. An example of the preferable anode is an electrode control with	U.S. PACIENT DOCUMENTS 4,443,304 4/1944 Edechm	cacilisting rod (32) connected to the cacilistion generator, and multirage cacilisting vanes (38) attached to the cacilisting rod, and the cacilisting vane is such that a sin med	
	lead oxide.	5,464,500 in1090 Bernard of d	portion of the wase is fluttend when an oscillation is transmitted from the oscillating red to the wase.	/ /4 - 1
4 4 0	Detailed Description Text - DETX (116):  The process of Examples 11 and 12 were each repeated except that the anode 6  of Estainless steel plate and the exthode of copper plate plated with nickel were used, and a waste limit having the collections.	275130 12/1991 Jupan.	18 Claima, 12 Drawing Sheets	<u></u>
	The composition was used:		ō,	
Control of the contro	Current UB Original Classification - CCOR (1): 205/742		16 4 18	٦
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	Document ID $\nabla$	United States Date-1	
		Office States Falent [19]	[11] Patent Number: 5,558,75
	US 5599477 A 17 T T T T T T T T US 5599477 A 17	Gardner-Clayson et al.	[45] Date of Patent: Sep. 24, 199
		(%) METHOD FOR DEWOOTN	
1	32 US 5578191 A 12 [		S1981 Aglades et al.
) <b>8</b>	53 US 558755 A 8 7 7 7 7 7 7 7 7		9/1982 Kauffnan 5/1983 Smith er al
<b>E</b>	34 UB 5531865 A 14 □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	[75] Inventors: Thomas Gardner-Chayson, Buffalo; Patrick J. Flley, Amberst, both of N.Y.	
*		[73] Assignce: Recra Environmental, Inc., Amherst,	REIGN
Ŧ	US-PAT-NO: 5558755	÷.	0341614 5/1989 Burnocan Par. Off
î	DOCUMENT-IDENTIFIER: US 5558755 A	[21] Appl. No.: 219,701	
Î	TIPLE: Method for removing contaminants from an account and account account and account account and account account account and account account and account account account and account ac	[22] Filed: Mar. 28, 1994	OTHER PUBLICATIONS
7		Related U.S. Application Data	"An Electrochemical Way of Stripping Waste from Water' Chemical Engineering, Dec. 1990, p. 15.
€ €	KWIC	[62] Division of Ser. No. 882,341, May 13, 1992, Par. No. 5,372,690.	"Electro-Coagulation—Some Basic and Operating Characteristics", Donini et al., 11th international Coal Preparatio
1 6	Detailed Description Text - Demy (20).	Int. Cl.	Congress, Toyko, 1990, pp. 253–256. "Alternating Current Electrocognistion for Superfluid Sir
9 ]	Electrocoagulation operating conditions are dependent upon the chemistry of the acusous medium 20 and the	[52] U.S. Cl	Remediation", C. F. Farrell, presented at U.S. Environmental Protection Agency Secumeants Armed BDE: User January
P	therein. The treatment rate of the aqueous medium 20 through the	204/150, 151, 152, 571	Waste Research Symposium, Cincinnati, Ohio, Apr. 1991.
ණ .	caetrocosquistion cell 12 is dependent both on the solution chemistry (conductivity), the nature of the entrained engagement	[56] References Cited	Primary Examiner John Niebling
ď	extent of electrocoagulation required to achieve the treatment. The following	U.S. PATENT DOCUMENTS	Auomes, Agent, or Firm-Hodgson, Russ, Andrews, Wood
0	unte of apparatus which may be provided in accordance with the example being provided for purposes of illustrative	9/1938	& Goodyear, LLP
<u>a</u>	ocoagulation may be used	Lundquist, Jr. et al.	[57] ABSTRACT
4	that is	10/1976 Gerren at al. 1/1977 Andrus	Apparatus and method for removing comaminants from a aqueous endium. The apparatus includes a fluidised had o
4	Ind claillier may receive filtrate from the final rotary vatage of production of high-purity TiO.sub.2 ; the clarifier	3/1977 Watemsho et el. 9/1977 Miller	metallic particles through which the medium is flowed and
٥ ،	of the fine-grained TiO, sub. 2 that passes	10/1977 Mosslich et al.	agglomerating contaminants in the medium. In order u
D E	A portable skid-mounted alternating current ele	6/1978 Moeglich	allow the electrodes to be non-consumable so that they do not require frequent replacement, the particles are consum-
l if	pactry of 70 gpm lls manufactured	12/978 Moeglich	able.
4	le 80 PVC pipes, a self-priming, close-coupled cent ting piping and valving, a 24 KVA transformer, and	12/1980	7 Claims, 2 Drawing Sheets
<b>4</b>	panel. Within each electrocoagulation cell may be installed two electrodes	1	
<u></u>	ecest which may be silver electroplated), each 2 inches in width in length, installed on diametrically opposed sides of the cell.		4
<b>E</b>	and a pectron atmeter stainless steel bolts may be welded to the sach sections and the electrocosquiations.		i
≘ e	de. The 4 PVC pipes may be stream to be electrocoamistal	\	
ı (2	cells. At	200	
· <del>/</del>	pellets within the		
Ø	Julation cell may be dization of the	+	
Ð	ulation cell is in operation and a pellets is required, but		
<b>A</b>	o used; although the		9
•	()/ ypum at 10-reet Total Head), se pump discharge back to the	7	<u> </u>
9 6	reduced ir can	000000000000000000000000000000000000000	Þ
9 6	Injected into the effluent feed line at the base of each electrocoagulation. I (immediately below the base) perforated pleatic screen) to assist in		
	Curoulence within the cell or in improving the pellet dissolution litching within the electrical control panel permits electrical nower		
	Julation cells at 5 distinct 60 VAC. The maximum current	•	
	each electrocoagulation cell is limited to 90 amperes. The influent		
		<u> </u>	

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